REMARKS

Claim 19 has been amended. Claims 1-18 and 21 have been cancelled. New claims 23-38 have been submitted as indicated above in accompaniment of a Request for Continued Examination under 37 C.F.R. § 1.114. The Applicant respectfully requests that this application be allowed and forwarded on to issuance.

§ 101 and § 112 Rejections

Claims 1-9 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Specifically, the Office asserts that claims 1-9 are directed to a non-functional data structure (page 2 of Office action).

Claims 1-10 and 14-18 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention (page 4 of Office action).

As indicated above, claims 1-18 have been cancelled herewith. New claims 23-38 have been submitted herewith. Applicant believes that new claims 23-38 recite subject matter that overcomes the respective § 101 and § 112 rejections cited above. In particular, Applicant asserts that new claims 23-38 are drawn to statutory subject matter consistent with, among other things, the provisions of MPEP 2106. Furthermore, Applicant asserts that new claims 23-38 respectively recite elements that are cooperative and interrelated with one another.

In view of the foregoing, as well as the arguments presented below, Applicant respectfully requests reconsideration under §§ 101 and 112 in favor of timely allowance.

§ 103 Rejections

Claims 1-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over "Object Oriented Design for a Distributed Priority Queue" by Pen-Nan Lee et al. ("Lee"), in view of "Shortest Path Algorithms" by Gallo et al. ("Gallo").

As claims 1-18 and 21 have been cancelled as indicated above, the § 103 rejections there against are now moot. The Applicant disagrees with the § 103 rejection of claims 1-22, but cancels claims 1-18 and 21 without waiver, prejudice, or disclaimer only to advance the prosecution of this application. The Applicant reserves the right to pursue these cancelled claims in the future. Applicant further argues in favor of claims 19-20 and 22 as follows:

The Claims

Claim 19 has been amended, and as amended recites a method implemented at least in part by a computing device for adding a new entity having a rank within a plurality of N ranks to a plurality of entities as represented in a data structure for efficiently ordering the entities, the entities also having respective ranks within the plurality of N ranks, the method comprising:

- of a plurality of array entries of an array having fewer than N entries over which the plurality of N ranks are distributed, such that the array entries correspond to respective ranges of ranks, determining a particular array entry corresponding to a range of ranks in which the rank of the new entity lies;
- adjusting the particular array entry to point to the new entity in response to determining that the particular array entry currently points to null;
- adjusting the array entry to point to the new entity in response to determining that the array entry current points to an entity having a rank less than the rank of the new entity;
- linking the new entity into a vertically linked list linking in at least

one direction a corresponding subset of the plurality of entities having an identical rank, in response to determining that the rank of the new entity is equal to the rank of any other entity within the plurality of entities; and,

- otherwise, linking the new entity into a horizontally linked list linking at least a subset of the plurality of entities in at least a descending rank order direction, the entities in the horizontally linked list having unique ranks as compared to the ranks of other entities in the horizontally linked list, wherein at least one entity of the plurality of entities is a thread, the rank of the entity is a priority for the thread, and the array is a priority queue.

In making out the § 103 rejection against claim 19, the Office asserts that the subject matter of claim 19 is made obvious by Lee in combination with Gallo. Applicant respectfully traverses the rejection of claim 19.

In particular, the Office has admitted that neither Lee nor Gallo teaches or suggests any method wherein at least one entity of the plurality of entities is a thread, the rank of the entity is a priority for the thread, and the array is a priority queue, as recited by the subject matter of claim 19, as amended (page 15 of Office action). However, in this regard, the Examiner has taken Official Notice that "it is well known in the art that threads are entities that are queued for serviced [sic] according to some priority structure and therefore would be obvious to one of ordinary skill in the art that threads are queued using the data structure of Lee and Gallo" (page 15 of Office action).

Applicant asserts that a rejection based on the assertion that particular subject matter is "well known in the art" should be supported by a showing of adequate evidence. Please refer to MPEP 2144.03(C). Therefore, Applicant respectfully requests that the Examiner provide an affidavit in support of the Official Notice as taken.

Applicant agrees that neither Lee nor Gallo teaches or suggests any method wherein at least one entity of the plurality of entities is a thread, the rank of the entity is a priority for the thread, and the array is a priority queue. Applicant further asserts that neither Lee nor Gallo teaches or suggests that a thread is an appropriate entity for use in *any* sort of data structure, not the least of which as specifically recited by claim 19, as amended.

Simply put, neither Lee nor Gallo teaches or suggests all of the elements as recited by the particular and cooperative subject matter of claim 19, as amended. Further still, neither Lee nor Gallo provides any motivation to combine the specific elements as recited by claim 19 (as amended), as neither Lee nor Gallo teaches or suggests that such a combination is desirable (or even operable). Please see MPEP 2143.01(I).

For at least the foregoing reasons, as well as for other reasons argued previously in prosecution, Applicant asserts that the § 103 rejection of claim 19, as amended, is unsupportable and must be withdrawn. Applicant further request reconsideration and withdrawal of the rejection of claim 19.

Claims 20 and 22 depend from claim 19 (as amended) and the comments directed above to claim 19 apply equally to the claims 20 and 22. Applicant respectfully requests reconsideration of claims 20 and 22 in favor of timely allowance.

New Claims

New claims 23-38 are submitted herewith in the interest of clarity and in moving the Application forward to allowance. The new claims 23-38 recite subject matter distinct from the art of record for at least the following reasons.

In regard to new claim 23, that claim recites a machine-readable medium having a data structure stored thereon, the data structure configured to be accessible by a computer, the data structure comprising:

- a plurality of entities having respective ranks within a plurality of N ranks, at least one of the entities being a thread having a rank that is a priority for the thread;
- a horizontally linked list of at least a subset of the plurality of entities, each of the entities in the horizontally linked list having a respective unique rank relative to the ranks of other entities in the horizontally linked list, the horizontally linked list arranged in rank order; and
- an array having a plurality of fewer than N array entries, the array entries associated with respective ranges of the N ranks, at least one of the array entries pointing to an entity having a greatest rank that is within the range of ranks associated with the at least one array entry, wherein the array is a priority queue.

Neither Lee nor Gallo teaches or suggests any entity including a plurality of entities having respective ranks within a plurality of N ranks, at least one of the entities being a thread having a rank that is a priority for the thread, as recited by the subject matter of claim 23. Furthermore, Neither Lee nor Gallo teaches or suggests any entity including an array having a plurality of fewer than N array entries, the array entries associated with respective ranges of the N ranks, at least one of the array entries pointing to an entity having a greatest rank that is within the range of ranks associated with the at least one array entry, wherein the array is a priority queue, as recited by the subject matter of claim 23.

In short, neither Lee nor Gallo – taken alone, or in any combination – teaches or suggests all of the required elements as recited by claim 23. Furthermore, no combination of Lee and Gallo suggests the desirability of such a

combination.

In regard to new claim 31, that claim recites a method implemented at least in part by a computing device, the method for removing a particular entity from a plurality of entities of a data structure, the entities having respective ranks within a plurality of N ranks, the data structure including an array of one or more array entries, the method comprising:

- in response to determining that the particular entity is present within a vertically linked list of a subset of the plurality of entities having an identical rank, delinking the particular entity from the vertically linked list;
- in response to determining that the particular entity is present within a horizontally linked list of a subset of the plurality of entities arranged in a rank order, delinking the particular entity from the horizontally linked list;
- in response to determining that one of the array entries points to the particular entity, adjusting the array entry to point to one of null and another one of the plurality of entities; and
- storing the data structure on a single machine-readable medium accessible by the computing device, wherein at least one of the entities is a thread having a rank that is a priority for the thread, and wherein the array is a priority queue.

Neither Lee nor Gallo teaches or suggests any method for removing a particular entity from a plurality of entities of a data structure, the method comprising storing the data structure on a single machine-readable medium accessible by the computing device, wherein at least one of the entities is a thread having a rank that is a priority for the thread, and wherein the array is a priority queue, as recited by the subject matter of claim 31.

Neither Lee nor Gallo – taken alone, or in any combination – teaches or suggests all of the required elements as recited by claim 31. Additionally, no

combination of Lee and Gallo suggests the desirability of such a combination.

For at least the foregoing reasons, Applicant requests examination on the merits of new claims 23 and 31, as well as new claims 24-30 and 32-38 that respectively depend there from, in favor of timely allowance.

Conclusion

The Applicant requests favorable action on claims 19-20, 22 and new claims 23-38 at the earliest convenience of the Office, in favor of timely allowance.

Respectfully submitted,

Dated: March-29-2007 By: Scott K. Gallert

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